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Western Pine Beetle
Extermination Experiment

Timbered Mt. Unit.

Modoc N. F.

J. P. Keen. Oct. 1928.

WESTERN PINE BEETLE EXTERMINATION EXPERIMENT
TIMBERED MT. UNIT, DEVIL'S GARDEN DISTRICT
MODOC NATIONAL FOREST, CALIFORNIA

The results of many control projects that have been directed against the western pine beetle in yellow pine stands have demonstrated that the effects of control measures is of a very temporary nature. Usually within two ~~xxxxxxx~~ years after an area has been cleaned of infested trees by the control methods now in use, it becomes reinfested to such an extent that the volume of losses differs but little from those on nearby areas that were left untreated. Obviously this reinfestation must come either from a building up of the number of beetles that were missed during the progress of the control work and left within the control area, or from beetles flying in from outside untreated territory. It is entirely possible that both sources contribute to the infestation that develops after control work. In any case it has been almost impossible, except by inference, to determine conclusively just whence the beetles come to attack the new crops of bug trees.

The only experimental attempts that have been made to answer this point, with its important bearing upon control policy, were carried out on the San Joaquin Project. Here an area of about 3600 acres, entirely surrounded by yellow pine type with similar infestation, was worked intensively for a period of three years. Results indicated that most of the new infestation was due to beetles coming in from the borders of the control area. However, the distance which these beetles may have traveled before reaching these borders could not be determined under the conditions of the experiment.

For a number of years the Bureau of Entomology has been trying to locate a completely isolated small block of yellow pine where control work can be carried on intensively for a number of years. The object is to determine whether or not the western pine beetle can be completely eradicated under these conditions, and to study the volume of beetles and the distances they may fly in reinfesting such an area. During the past season an area fulfilling many of the requirements has been found on the Devil's Garden District of the Modoc National Forest.

Area and Volume of Timber Stand

Timbered Mountain is a small knoll about four miles in length and three miles in width, rising above the general level of the Devil's Garden plateau. The higher level of the mountain carries about 500 acres (see attached map) of virgin yellow pine stand of Site 4 quality, running to about 8,000 board feet per acre. Around this heavier stand is about 800 acres of lightly timbered area, running about 3,000 board feet per acre. Extending from this area for about a mile in all directions is a very open, scattered stand of pines mixed with junipers, not exceeding one yellow pine tree to the acre. Surrounding the mountain and extending in all directions is a pure stand of juniper, with only an occasional isolated pine tree. From the border of the pine stand it is fully six miles to any other pine areas, and these are found only on the north, northeast and northwest sides. To the south is merely juniper and open country. The present pine stand is estimated at 10,000 M. b. m. on a total area of 5,400 acres. The entire area is National Forest land.

Past Infestation

During the last few years, the western pine beetle has been very active on this mountain and has killed fully ten per cent of the former stand. The peak of the epidemic seems to have been reached in 1926, and in that year large groups of trees were killed. Since that time the epidemic has been on the decline.

Present Insect Conditions

In 1927 the loss dropped to an estimated total of 200 trees for the entire area, and when cruised on September 13 of this year the 1928 loss was evidently 50 per cent less than the 1927 loss. It is estimated that not over 100 trees will be killed by beetles on the area during 1928, of which not over 60 trees will contain the overwintering broods requiring treatment in any control program.

A Control Plan

The treatment of this area would contemplate protection of the tract from further beetle activity, and the acquisition of additional information on the effectiveness of control, the possibility of beetle extermination and the distance of flight. The objectives would be:

- (1) To stop beetle loss on this unit;
- (2) To determine the reduction due to control from one, two and three successive treatments on an infestation uninfluenced by adjacent infested areas. This would take into account the reduction or increase due to natural causes by comparing the trend of this infestation with the nearest untreated areas, such as Crowder Flat;
- (3) After two seasons of control, carried out as in commercial control operations, where the removal of 100 per cent of the infestation is never realized, a third season of very intensive work would be undertaken

to determine the possibility of complete extermination. This should not be difficult at that time, since the infestation should be at a very low ebb.

(4) If extermination is secured, the area would then be watched to determine in what manner an isolated area becomes reinfested. If the beetles fly in quantities over a barren area of six miles, and if so are they able at once to kill standing trees, or must they first breed up in broken tops, windfalls or other weakened material?

(5) The area also lends itself to a complete study of the character of infestation present in every tree and a determination as to what extent trees may die without the agency of insects.

The first control treatment should be completed before May 1, 1929.

Cost of Control

With only 60 trees to be treated during the present season, the work involves little difficulty. This number of trees can be treated by a crew of six men in five days. The spotting of the area will take a three-man crew eight days. Altogether it is about a two-weeks job for a crew of six men, and the total cost, including salaries of personnel, should not exceed \$650, divided as follows:

Salaries - - - - -	\$450
Subsistence, transportation and equipment - - - -	200
Total - - - - -	\$650

If regular employees can be used on the work the amount required from a special allotment need not be over \$200.

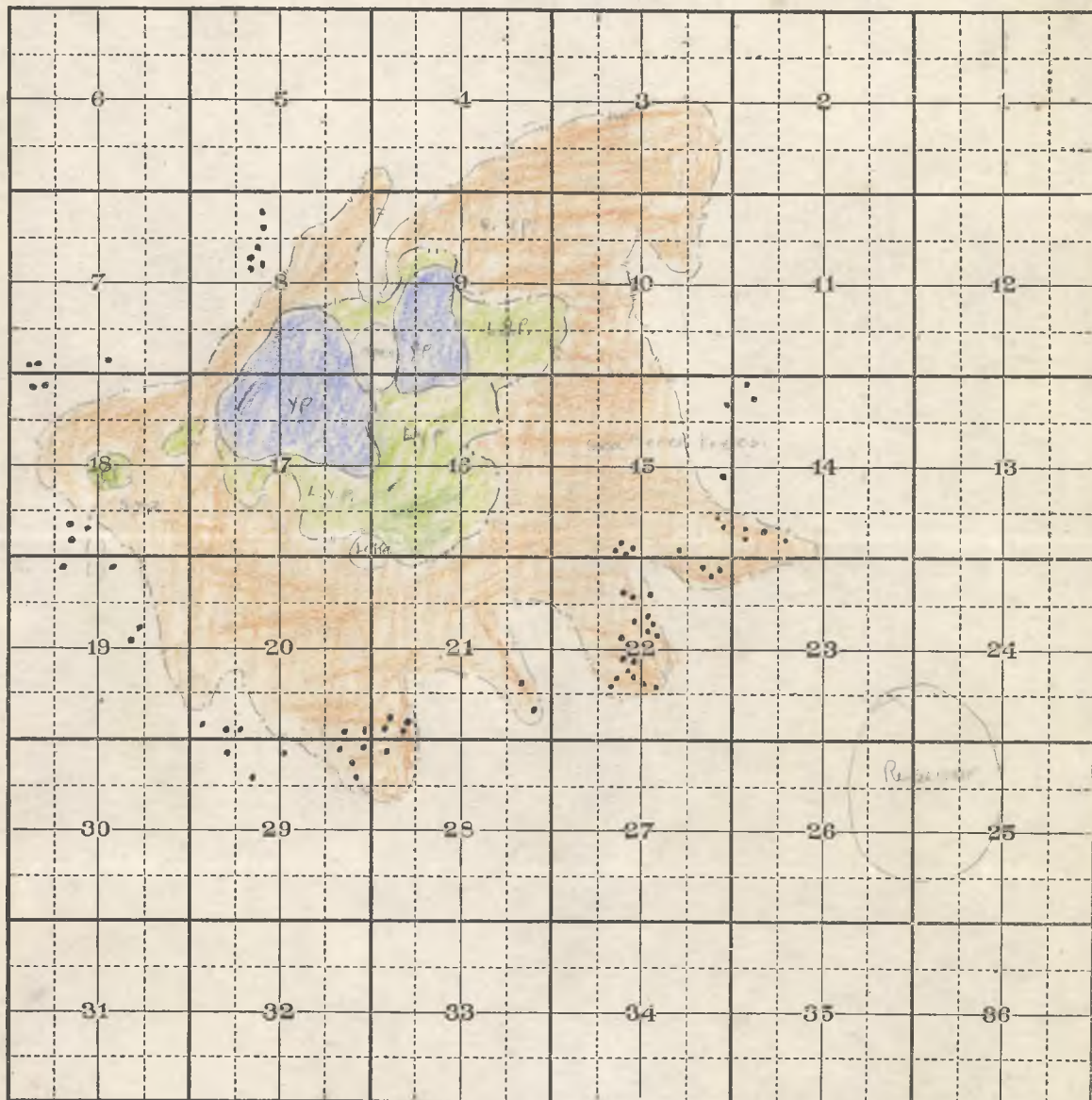
During the first season of work, the cooperation of the Forest Service would be highly desirable. If the Bureau furnished three men and the Forest Service three men, no extra help would be needed.

After the first season the Bureau should plan on doing all the work, as each tree felled should be studied to determine the character of the infestation. Since it is expected that not over thirty trees will need treatment in the second season, this work should be handled by the Bureau personnel without difficulty.

T. 45 N

R. 11 E

Timbered Mt. Devil's Garden Mer.



Legend:-

- Blue - yellow pine stand 8,000 bd ft. per acre.
- Green - light yellow pine stand 3,000 " " "
- Orange - scattered pine trees - not over 1 tree per acre.